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EDITORIAL NOTES

THE FUTURE GAS INDUSTRY

THE Gas Industry has prominently before it two problems. First, its possible role in a comprehensive fuel policy; secondly, the means by which the Industry intends to remodel itself to meet new requirements. The new Ministry of Fuel will, most likely, call for a dispassionate enquiry, and the Director-General of Gas Supply has succinctly stated that what is wanted is a scheme, determined within the Industry, which after consideration can be put forward, with the help of the Directorate, as a basis for the needed powers. The view the Director-General has been at pains to emphasize is that the best and surest way to satisfactory reorganization is for the central authority to seek powers from the known wishes of the regions expressed through their existing organizations. Foremost in current thought on the subject are considerations of regionalization, the interlinking of undertakings over defined geographical areas, and unit working on the large scale. Can the Industry—that is, those primarily concerned with the problem—find help or guidance in the formulation of its ideas by taking full note of the experiences of other public utility undertakings and "corporations" working on what we may term the grand scale? Can something useful be learned, for instance, from the structure and operational results of the electricity grid, from water supply, or even from a body such as that of the Port of London Authority? What does regionalization or joint working imply in practice?

Thinking on these lines it occurred to us that it might assist if we delved somewhat into the ways in which these other utilities and "corporations" are managing their affairs, and the result of our necessarily limited study is a series of articles, the first of which we publish in our columns to-day. We publish this series in the hope that it will be useful as well as interesting to Gas Industry planners, and that it will stimulate and perhaps clarify thought and so help towards definition of the "Future Gas Industry." In doing so we should like to record our appreciation of the friendly way in which our enquiries were met by the executives of the organizations with which we shall deal. At a time of stress like the present, the help given so freely has been a source of no little encouragement.

EDUCATION

WE publish to-day the Report of the Board of Examiners on the 1942 examinations of The Institution of Gas Engineers, and it is a thoroughly depressing affair. We do not know to what extent it can be regarded as a criterion of what we are in for regarding the personnel of the post-war Gas Industry. If it is any criterion the prospects are gloomy enough. Either there is something fundamentally wrong about the Institution examination system, or a large percentage of the number of candidates must be subnormal. Either the position is serious, or the standards set are too high for current circumstances—too academic, in fact. Against which latter thought, we are told in the Report that questions were so chosen that no candidate daily engaged in his work of gas manufacture or supply should have difficulty in answering them. The facts are that last year the number of candidates presenting themselves was much lower than in previous years, and we learned from the 1941 report of the examiners that the standard of work, too, was much lower. The drop in number was inevitable, the drop in quality disquieting. This year the number is still lower and the quality is no better. Of course, wartime conditions are not conducive to study; wartime activities curtail the time available. Allowances must be made. The Board states that it appreciates the difficulties confronting the student at the present time and then proceeds to paint its depressing picture, which would have caused us graver concern, however, were it not for the uncheerful nature of the majority of the Board's reports pre-war.

It will, we think, be agreed that the Industry needs well-trained men; but let us look at the report in question, with its high percentage of "failures." In general, candidates have "little detailed knowledge of their subject." In Higher Grade Gas Engineering (Manufacture) the results were "very disappointing," the standard was low, and many candidates showed "a lamentable ignorance of even elementary principles of design." The results of the Diploma examination were "disappointing," and "a knowledge of current literature and problems was noticeable by its absence." In Higher Grade Gas Engineering (Supply), "the answers submitted revealed the failure on the part of many candidates to display knowledge—fundamental, practical, and theoretical—of gas distribution." One candidate entered for the examination for the Certificate in Gas Supply. He failed.

We do not know what encouragement post-war planners will get from this sorry story, but there can be no doubt that plans will go awry without skilled personnel to carry them out in practice. Developments envisaged in the direction of interlinking and the regionalization of gas supply, for example, will require the services of not few, but many, technicians skilled in the application of the principles of gas distribution at low and more particularly at high pressures; working in larger units means the creation of a greater demand for specialists in many branches of gas manufacture. If the raw material—the young men entering the Industry—is of a nature such as the present report of the Board of Examiners of the Institution suggests, one can hardly regard the future of the Industry with equanimity.

The latest news concerning education under the Institution Scheme is that, commencing with the 1943 examinations, candidates for the Diploma examination in Gas Engineering (Manufacture) or (Supply), in addition to sitting for the written examination, will have the option of either submitting an original thesis, as formerly, or taking a Home Question Paper. We regard this as a welcome innovation. In small undertakings candidates for the Diploma examination may seldom have the opportunity of carrying out research, and consequently the subjects available to them on which to write theses are more restricted than for candidates in the larger undertakings. We like this practical measure to assist candidates, and consider the introduction of this alternative as being especially appropriate at the present time. We are glad that it was not deferred till the post-war period. The object of the Home Paper, particulars regarding which we publish on a later page, is to test the candidate's ability to apply basic principles and given facts. The questions, we are informed, will be chosen in such a way that a candidate can develop his answer on these lines even though he may have had no practical experience of the particular subject to which the question relates. A candidate will be expected to submit a detailed report on the subject such as would be required for a problem in actual practice, and where called for give specifications and detailed estimates of costs and charges.

INSTITUTE OF GAS TECHNOLOGY

DISCUSSING Gas Industry education, it is interesting to turn to what is being done in America, and in this issue will be found an account—a most encouraging account—of the progress of the Institute of Gas Technology, situated in Chicago,

which in September of last year opened its doors for service to the Gas Industry. The Institute, which is well housed—obviously much better housed than the Fuel Department at Leeds University in its early days and even to-day—is in many ways working on similar lines to the Department at Leeds, though it would appear that its scope is different. It has as its objectives, in addition to the training of men and research, the collecting and disseminating of scientific information and encouragement of independent research within the Industry. It is affiliated with the Illinois Institute of Technology and co-operates also with the Armour Research Foundation, which is an industrial research organization, and affiliation has helped the new Institute to get quickly under way. Pure research and research on problems basic to the Industry are carried on from general funds provided through contributions from member undertakings; patents from developments belong to the Institute but are available to member undertakings on a licence basis. Research conducted for individual companies or groups of companies is confidential, and the results or patents are available only to the sponsoring companies. Thus the Institute is able to carry out research on the fundamental problems in the Industry for the membership at large, and at the same time conduct private investigations for individual undertakings. The first sponsored research established concerns the problem of removal of organic sulphur from gas. We hope that, to prevent unnecessary overlapping of research, full cognizance will be taken by our American friends of the intensive investigation on this subject which has been undertaken in Great Britain, and that the results of the work, as published in Communications of The Institution of Gas Engineers, will be carefully studied.

In regard to training, it has been determined that four years' academic work is needed for a Ph.D. degree, but only two years' work for a Master of Science degree (compare this country), and it is considered that a man equipped with the latter qualification can enter the Gas Industry in either a scientific or a minor executive capacity. The curriculum for the third year, when the student concentrates on "gas technology," is interesting. It includes study of "cracking" processes, unit processes, synthetic solvents, public utility and plant management, and, of course, manufacture, distribution, and utilization of gas. If a student at the end of the third year finds he is not "research-minded," then it is considered that he is fitted as a good candidate for the Industry in capacities relating to administration, engineering, and science. It is expected, however, that 60% of the students will go forward to their fourth year, and spend it entirely on research on some problem basic to the Industry.

The entire financial structure of the Institute is built on the principle that small yearly contributions from a large number of supporting undertakings will accumulate to a "truly significant Industry training and research fund." We wish the Institute, which seems admirably founded to further to a marked degree the interests of the American Gas Industry, all success, and shall follow its work.

Fuel Economy Appeal

Managing directors of 30,000 industrial undertakings all over the country have had a special appeal for fuel economy addressed to them by Mr. Oliver Lyttelton, Minister of Production. Enclosed with the Minister's letter was a note by the Ministry of Fuel and Power on coal supplies, which points out that the country is faced, for some time to come, with a serious general shortage of coal, including the high quality sized and cleaned coals which have become increasingly popular with the development of specialized types of firing plant. However efficient distribution may be, it is added, the maintenance of industrial production will depend on two things: improved methods of fuel consumption resulting in a decreased total demand; the increased utilization by industry of the types of fuel not at present in general demand, of which supplies are less short. The note adds that every effort must be made to work combustion plant as economically as possible, whether for space warming, steam raising, or process work, and to reduce fuel requirements to the minimum. On the advice of the Ministry's Fuel Efficiency Committee, and in collaboration with the Board of Education, discussion courses for management staff and demonstrations for boiler house operatives have so far been arranged at technical colleges and universities in some 40 industrial areas; any firm that has not already done so is urged to participate in these training schemes. Industrial undertakings consuming coal in any quantity should arrange to secure the services of a fuel efficiency expert to concentrate his attention on this problem. The note ends by pointing out that the Government requests all managements, in the national interest, to make arrangements at once to accept at least a proportion of their coal supplies in a lower grade than those normally supplied.

Guildford's Fuel Economy Exhibition

The town of Guildford, in Surrey, is the first to stage a civic exhibition in support of the Government's voluntary fuel economy campaign, and if the advice offered at the exhibition by word, picture, and display is followed there will be a big saving of domestic fuel—coal, gas, and electricity—in that community. In arranging the exhibition, which was opened last Saturday by the Minister of Fuel and Power, Major Lloyd George, a report of whose speech appears in our columns to-day, the Guildford Gas Light & Coke Company played a major part and deserve full marks for their enterprise. We have visited the exhibition and we found it a good show. The exhibits are simply arranged, but this makes them all the more telling; and each in its own way tells the same story of how fuel can be saved by the exercise of care, common sense, and patriotism. Gas meter reading competitions are being held for both children and adults, with Savings Certificates as merit awards, and cookery demonstrations, on both gas and electric cookers, are a feature of what is proving a very popular exhibition on a subject of vital national importance which concerns every single individual. This first-rate display comes to an end next Saturday, when, no doubt, thousands will have learned many useful lessons and gained to their and their country's advantage many useful fuel-saving hints. We hope and, indeed, have reason to believe that it will prove the forerunner of civic exhibitions of the kind throughout the country, when local gas undertakings will have the opportunity of following the example of the Guildford Company and pulling their weight in support of the Government's campaign.

Alternative Gas and Oil Production

In an editorial in the "JOURNAL" of July 29, p. 163, we referred to a suggestion made by a contributor to the discussion on the June Institution Papers that the Gas Research Board should investigate "a process for the treatment of coal under pressure to produce oils and gas." In point of fact the contributor was Mr. E. H. Harman, whose comments were published on p. 166 of the same issue, and he has pointed out to us, quite rightly, that we failed to give the proper import to his suggestion, which was as follows (we quote from his remarks): "I venture, therefore, to draw attention to the commercial possibilities of a plant which could manufacture liquid fuel or gas at will. Such a plant would help to take care of the winter gas load, and during periods of lower demand could be turned over to the manufacture of liquid fuels." We apologize for giving unwittingly a faulty interpretation of this suggestion and failing to emphasize the alternative nature of the plant envisaged. We regret any misunderstanding to which our comments may have given rise, though we may add that we pre-supposed that the Gas Research Board would have made itself informed of any such plant and of its possibilities, the collation and examination of such information being part and parcel of its current investigations.

Personal

Mr. R. S. SNELLING, F.C.I.S., General Manager and Secretary of the Newport (Mon.) Gas Company, has been appointed a Justice of the Peace.

* * *

Owing to ill-health, Mr. A. COOK, Engineer and Manager of the Warrington Corporation Gas Undertaking, has intimated his intention of resigning as from the end of September. He has consented to act as Consultant Engineer until the end of the year.

* * *

Mr. JOHN CRAIG MARSHALL, son of Mr. William Marshall, Gas Manager, Largs Town Council, has been appointed Technical Adviser and Assistant to the Manager and Secretary of the Londonderry Gas Company.

Obituary

The death occurred with tragic suddenness on Aug. 5 of Mr. F. S. TOOBY, at the age of 60. For the past 30 years he had controlled the whole of the buying and selling of the Midland Branch of Messrs. Baldwins Ltd., and in his dealings alike with suppliers, customers

and staff of the Company his sterling character was universally recognized, and a very large circle of business friends will greatly miss him. He entered the employ of Messrs. E. P. & W. Baldwin, Ltd. (later absorbed by Baldwins Ltd.) at the early age of 13.

1942 "Journal" Directory

Page 24. EVESHAM. C. H. Edwards, *E. & M.*, *vice* P. H. Fletcher, deceased.
" 54. PETERSFIELD. A. W. Clark, *G. M. & S.*, *vice* F. Higginson, retired.
" 74. WESTON-SUPER-MARE. W. J. Baker, *E. & G. M.*, *vice* J. Taylor, deceased.
" 80. AYR. J. Steen, *S.*, *vice* J. Wilson, deceased.

Major Lloyd George at Guildford

At Guildford last Saturday the Minister of Fuel and Power opened a fuel-saving exhibition, the first of its kind in the country.

The success of the campaign to economize in fuel, he said, depended on the individual. There was a genuine feeling throughout this country to economize in the use of fuel. People were anxious to do it, but many had not the knowledge and it was the duty of his Ministry to see that they had the knowledge. There was still too much waste in industry, although great things had been done, and he was hoping very much that the voluntary appeal would succeed. He was a believer in the voluntary appeal, and would rather see people respond to something because they understood why they should do so. He firmly believed they could avoid rationing, and by voluntary appeal would be able to see this winter through by saving unnecessary waste.

"I am not saying you won't have to have some inconvenience this winter," he continued. "You may even have a little hardship, but what is that compared with those who are on the North Atlantic and the Arctic Ocean in winter in our ships, or in the sands of Africa and in the air over Germany? If I were to say 'considerable hardship' it will be small compared with the hardships we expect our boys to put up with in the various spheres where they are fighting for us."

Stringent economy must be practised this winter. Coal consumption, which was going up, must be cut down, and production, which had a tendency to decline, must be increased.

Speaking of industry, Major Lloyd George said there was a great deal that could still be done, although great savings had been made by the management and by workers in factories and offices—he did not exclude Government factories and Government offices.

"The fact that you are on priority work," he said, "does not entitle you to waste anything, and those on Government work and in Government offices must respond as well as anybody else. It is up to them to show an example. The same applies to hotels, restaurants, theatres, and cinemas. Waste must cease, and I hope it can be done by voluntary methods."

Home Question Paper for the Diploma Examinations

Commencing with the 1943 Examinations, candidates for the Diploma Examination in Gas Engineering (Manufacture) or (Supply) will, in addition to sitting for the written examination, have the option of either submitting an original thesis or taking the Home Question Paper.

Candidates for the Diploma in either Gas Engineering (Manufacture) or (Supply) wishing to take the Home Paper in lieu of submitting a thesis should apply to the Secretary of The Institution of Gas Engineers, 1, Grosvenor Place, S.W. 1, not later than Dec. 1 in the year prior to that in which they intend sitting for the main subject examination in Gas Engineering (Manufacture) or (Supply).

It is anticipated that the Paper will be available on or about Jan. 1 in each year; candidates will be required to return their worked papers so as to reach the Secretary of The Institution of Gas Engineers not later than April 30 in the year in which the written examination is to be taken.

Published data and papers may be consulted, but reference at the appropriate place in the answer must be given.

Drawings should conform with the normal conventions of engineering draughtsmanship, and should show the candidate's ability to produce drawings suitable for practical purposes. Drawings may be submitted in pencil or in ink, but must be in a form ready for immediate tracing.

Graphical methods may be used in the solution of problems.

Space Heating Radiator

Among the new patents is one (No. 545,339; application date, Feb. 13, 1941), granted to Radiant Heating, Ltd., and Arthur Docking. It relates to space heating devices of the kind where the heating effect is primarily derived from radiation from the conbustion of gas under pressure, and is augmented by radiation from a relatively low temperature surface heated by the hot gases emanating from the primary heater.

The primary heater consists of a perforated block, preferably moulded, of highly refractory material. The perforations in the block are provided at the back with refractory elements, preferably of china clay or like material, each having a plurality of holes to permit of the passage through them of the combustible gas mixture. The front ends of these elements lead to openings, or combustion tunnels, which preferably taper outwardly, in the refractory block within which the gaseous mixture burns. The combustion tunnels, which may terminate in china clay or like tubular extensions, are surrounded on all sides by a refractory canopy. The refractory block, including the surrounding canopy, is enclosed in a cast-iron casing, the back of which forms a chamber to which the combustible gaseous mixture is supplied under the necessary pressure. Mounted on the top of the cast-iron container and extending above and at an angle to it a hollow radiation panel is so arranged that the products of combustion from the primary heater pass through it. The front wall of this panel becomes heated by the gases and affords a further relatively low temperature radiator. This hollow panel is provided at its back with heat insulation so as to ensure maximum heating of the front wall.

In operation the combustible mixture is supplied to the space behind the perforated refractory block and passes through the multiplicity of holes in the china clay elements and thence into the conical combustion tunnels in the refractory block. Initial ignition can be effected by a single pilot light, and by reason of the proper dimensioning and disposition of the combustion tunnels and surrounding canopy ignition of all the jets is effected, the canopy forming a pocket which becomes full of the combustible mixture so that ignition at one point ensures flashing across the whole face of the burner constituted by the perforated refractory block and ensures the exclusion of any secondary air entering the combustion tunnels.

The correct inflammable mixture may be supplied by air under pressure and low pressure town gas, or by high pressure gas inducing the necessary air through any known type of injector, no secondary air being required.

At the Annual Meeting of Montrose Gas Company, Ltd., a dividend of 4¼% making 8½% for the year, was adopted.

The Directors of the Newcastle and Gateshead Gas Company have declared interim dividends of £2 on the preference stock and £2 10s.% on the ordinary stock. These are the same rates as last year.

Kirkcaldy Town Council intimate that the tariff of gas charges to consumers in the Dysart area of supply will be reduced to the rates applying within the Kirkcaldy area as from the date of the last survey.

Copies of the recently published British Standard No. 1034 : 1942, "Test Code for Continuous Vertical Retorts," may be obtained, price 2s. each, from the Secretary of The Institution of Gas Engineers, 1, Grosvenor Place, S.W. 1. Also British Standard 1044 : 1942, "Recommended Designs for Gauges."

Meetings of the London and Counties Coke Association will be held as follows on Monday, Aug. 17, at Gas Industry House: Finance Committee, 10.30 a.m.; Executive Committee, 11.15 a.m.; Central Committee, 1.30 p.m.

At a Meeting of the Directors of the Wandsworth and District Gas Company held on July 28, dividends for the half-year ended June 30 were declared as follows: On the 4% Preference Stock, £4% per annum; on the Consolidated Stock, £4% per annum (both less income tax). These will be paid on Sept. 1.

At a Meeting of the Board of the East Surrey Gas Company held on July 28, the under-mentioned dividends were declared for the half-year ended June 30, all less income tax at 10s. in the £, and payable on Sept. 1: On Cumulative Preference Stock, 3% actual (£3 per £100 Stock); on Redeemable Preference Stock, 2¼% actual (£2 5s. per £100 Stock); on Preference "A" Stock, 2¾% actual (£2 15s. per £100 Stock); and on Ordinary "B" Stock, 2½% actual (£2 10s. per £100 Stock).

A Dividend at the rate of 4% less tax, was declared at the annual meeting of the Lochgelly Gas Company, Ltd. It was stated that the Directors hoped to avoid raising the price of gas, despite the increased cost of coal. Bailie A. Forrester was unanimously appointed a Director in place of the late Mr. David Low.

At a Meeting of the Directors of the Cambridge University and Town Gas Light Company held on July 31, the following dividends were declared for the half year ended June 30 on the Ordinary Stocks of the Company: Consolidated Original Stock, 5% for the half year; Consolidated "B" Stock, 3½% for the half year; and Consolidated "C" Stock, 2½% for the half year (same as last year).

At the Annual Meeting of the Selkirk Gas Company, Ltd., it was reported that the profit for the year was £1,348. The total assets amounted to £67,114. The Directors recommended that £600 be added to depreciation, and that the dividend for the past year at the rate of 4¾%, free of income-tax, be made, towards which an interim payment of 2½% was paid in January last.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

THE GAS INDUSTRY OF THE FUTURE.—1.

To help the Gas Industry in forming its own opinion on the reorganization which is unanimously held to be necessary, the "JOURNAL" has recently made a study of the experiences of other public utility services which have been confronted with similar problems in recent years. In these notes an effort will be made impartially to review some of the principal schemes of regionalization in the other industries, with their possible lessons for the Gas Industry. The field of investigation covers water supply, regional transport, main line railways, port and dock authorities, the "public corporation," and finally the electricity industry.

"THE Gas Industry has a great future, but it must face radical changes." It does not matter when or by whom the text was introduced, but it is a fact that it has been echoed throughout the Industry ever since the appointment of Dr. E. W. Smith to the new and important office of Director-General of Gas Supply gave to the Industry an implied assurance of that recognition in high places that its achievements merit. There is no doubt about its contribution to the war effort or about its potentialities in the post-war industrial and domestic world. But there is a good deal of haziness about the "radical changes" which everyone is saying it has to face. How are its thousand more or less unco-ordinated units—many of them highly efficient, some of them at present too small to be economic—to be enlisted effectively in the post-war drive that is to enable the Industry to discharge its growing responsibilities as provider of one of the nation's most vital fuel services? Officially, through its Post-War Planning Committee, and unofficially wherever its responsible officials meet to interchange views, the Industry is studying those "radical changes," and signs are not lacking that it is taking due note of the Director-General's exhortation to form opinion within its ranks.

Experience of Others

The Industry must work out its own salvation—or accept whatever salvation is compulsorily imposed upon it through its own default—and it is quite outside the province of these notes to try to solve any of its problems. It is thought, however, that useful service would be rendered by examining what has happened in some of the other public services which have been rationalized and regionalized in recent years, and summing up some of the ideas that have been expressed within the Gas Industry itself during the war years.

Some of the other utilities—the Electricity "Grid" and London Transport, for example—are often quoted as models of modern business development. Of the seven or eight public services to be considered, some have characteristics comparable with those of the Gas Industry; others, newer in origin and less encumbered with antiquated legislation and "interests," have found shorter cuts to rationalization. Not all of them can be cited as ideals; indeed they vary so much that no single method of unified or regional, or "socialized" control would be applicable to them all. Most of the schemes examined have, however, in their turn been framed in the light of the earlier experiences of the others, and it may be that the Gas Industry will find in each something worth while considering, and some defect which it would do well to avoid.

It is proposed in this introductory note only briefly to diagnose the present condition of the Gas Industry, and to defer until a later article any examination of the constructive opinion so far formed within the Industry as to the changes that should be effected. It has a vital share in the national fuel policy of the future, a policy from which wasteful competititon and uneconomic operation must be eliminated; one in which all the fuel industries must be prepared to sort out their markets and take the loads for which they are best suited, and, having marked out their fields, develop their resources to make the best possible use of the available raw materials, the technical skill, and the administrative ability of their officers and the labour of their employees. Hundreds of thousands of pounds have been wasted in competition which has brought little benefit to the community, and too little has been done in the way of bringing the little undertakings that are the outposts of the Industry up to the standard of the most efficient.

The Industry To-Day

In a single sentence, the trouble in the Industry to-day is that it is still little more than a loose aggregation of a multiplicity of individual independent units; that it lacks co-ordination on technical and commercial policy; and that it is hampered by out-of-date legislation. There have been many highly successful amalgamations, and the development of the holding companies has done something to change the old order, although, when the holding companies began to overstep geographical groupings and sprawled across the country to mop up outside companies, they strayed from their original path, even though they may have brought to scattered works the benefits of centralized administration. The cry now goes up for regional control, without as yet any very set idea of how it should work, and if these articles help in any degree in crystallizing nebulous notions on the subject, they will have served their purpose. The interests of municipalities and companies may diverge, but they should not conflict. The "parish pump" must go, and something must be done to remedy a position in which, of the thousand isolated undertakings in England and Wales to-day, 17% are providing 87% of the total gas output, and 83% of them make the remaining 13% of gas. The smallest undertaking is not necessarily the least efficient, but it would clearly be better if it were linked—if only by way of consultative arrangement—with a bigger unit with the means at its disposal to provide technical and commercial direction equivalent to that of the largest works. Gas has an advantage over electricity in that it can be transmitted over fairly long distances without loss of potential, although there is, as Dr. E. W. Smith pointed out in the Area Gas Supply Committee report in 1930, a definite limit to the distance. There are profits to be made out of gas, but the Industry is first and always a public utility, and there is general agreement with the principle that there should be a limit to dividends in order that the business of the Industry may benefit from excess surpluses.

Is there an Ideal Unit?

No one has yet been able to define an ideal unit for sound and economic Gas Industry operation, for so much depends on many varying circumstances, just as it does in local government, which, in the opinion of some, is itself likely to go into the melting-pot after the war. Local government shows even more lack of uniformity in size of unit than the Gas Industry, and so affords no assistance in the determination of new boundaries. Supposing for a moment that the Gas Industry were to be redistributed on the basis of one undertaking for each county council area, there would be 62 undertakings in England and Wales, one serving 176 people per sq. mile in the 1,666,948 acres of Devon; one serving 37,580 people per sq. mile in the 74,850 acres of London; one serving 156 people per sq. mile in the 1,302,744 acres of Norfolk; one serving 115 people per sq. mile in Rutland's 97,273 acres, and another supplying gas to 7,063 people per sq. mile in the 148,691 acres of Middlesex. Matters would have been even more chaotic in the Gas Industry if every municipal council had insisted on an undertaking of its own, for there are 83 county boroughs, 500 municipal boroughs, and about 800 urban districts, besides the rural district and parish councils, most of them striving to uphold the "parish pump" which has produced so much isolationism in the past. A more promising line of study is to consider what the local authorities have done to rationalize some of the services they have in common. They have set up over 100 joint committees for town planning, with the obvious advantage of having one master plan for a whole unit, providing at least for the large matters of regional importance, with freedom to each local authority, if that be the general wish, to fit into the master plan by supplementary schemes or orders, matters which are primarily of local concern. Joint sewerage has been one of the big successes in regionalization, while joint hospitals have provided some of the plainest lessons in the technical advantages of working in larger units.

Public Corporations

Local government, however, can be dismissed as a possible pattern for regionalization in the Industry, which must look elsewhere for a solution. It may be possible, after looking at various other public utilities in detail, to suggest which way it should look, but, as has already been indicated, no single industry provides a cut-and-dried plan on which to work. Whether or not the "public corporation" principle would be a suitable one for the future working of the Gas Industry is a question for the Industry itself to decide. Mr. Herbert Morrison wrote ten years ago in *Socialization and Transport* (a book dealing mainly with the creation of the London Passenger Transport Board): "In earlier days it was assumed . . . that socialization could only take two forms—State Department nationalization with the Minister responsible for management, and municipalization under the council and its appropriate committee. The common remedy for the problem of the insufficiency of the municipal area had previously been the municipal joint committee, but this remedy cannot be advanced on grounds of democratic control, for the municipal joint

committee or joint authority is one of the least democratic instruments of public administration. For other than exceptional cases I suggest we shall be driven to making a clean cut between the concern of the municipality and the concern of the State. After all, Great Britain is a small country, and it is hardly necessary to provide for intermediate joint municipal bodies. We have already had two practical experiments in public corporations, neither of which did I follow slavishly or regard as entirely appropriate to the problem in hand—the Central Electricity Board and the British Broadcasting Corporation—examples of that socialist legislation which is respectable when introduced by a Conservative Government, but is Bolshevism if introduced by a Labour Government." The Central Electricity Board, the B.B.C., and London Transport are entrusted not to a Minister responsible to Parliament, but to boards of specially selected and responsible persons endowed with a large degree of initiative and independence as regards policy and execution.

Formation of opinion within the Industry is a voluntary matter, but the interests involved in any measure of comprehensive regionalization are so diverse that it is, to say the least, very doubtful whether it could be realized solely by voluntary action. There is a consensus of opinion that, having worked out the broad principles of a policy that would serve the best interests of the Industry as a whole, it should seek its enablement, if not its enforcement, through an appropriate Government Department.

INSTITUTION EXAMINATIONS

The following is the 1942 Report of the Board of Examiners on the Examinations of The Institution of Gas Engineers.

During the year 1941–42 the members of the Board of Examiners and Assessors appointed by the Council were:

Major Courses:

Examiners: L. P. Ingram, M.Sc., A.I.C. (Loughborough), Chairman; F. Dawson, B.Sc., Assoc.M.Inst.C.E. (London); D. Dougill, M.Sc., A.I.C. (London); G. H. Kenyon, M.Sc.Tech. (London); A. McDonald, B.Sc. (Castleford); H. S. Milne, B.Sc.(Eng.) (Aberdeen); T. F. E. Rhead, M.Sc. (Birmingham); H. H. Thomas, M.Sc. (Liverpool)—Gas Engineering (Manufacture). J. H. Dyde, M.Sc. (Uxbridge); W. A. Bishop (Croydon); W. H. Blundstone, B.Sc. (Newark); D. C. Gunn, B.Sc.(Eng.) (Leeds); A. C. Rea, M.I. Mech.E. (Bath); W. N. Smirles, B.Sc. (Birmingham); W. K. Tate, M.A., Assoc.M.Inst.C.E. (London); J. E. White (Newcastle-upon-Tyne)—Gas Engineering (Supply).

Assessors: Gas Engineering (Manufacture) and (Supply). West of Scotland: David Fulton (Helensburgh). East of Scotland: D. D. Melvin (Edinburgh) and J. W. Napier, M.B.E. (Alloa).

Minor Course and Gasfitting Courses:

Examiners: E. F. Keable (Worksop)—Gas Supply Practice; R. N. le Fevre (London), A. G. R. Kennett (Margate) and J. Robertson (London)—Gasfitting; A. Marsden, M.Sc. (Bristol)—Elementary Science.

Comparative Schedule of Examination Candidates.

Subject.	Grade.	1941. Internal.	1941. External.	1942. Internal.	1942. External.
Gas Engineering (Manufacture)	Ordinary	36	24	29	28
	Higher	23	13	12	20
	Diploma	—	10	—	4
Gas Engineering (Supply)	Ordinary	14	20	14	17
	Diploma	—	2	—	2
Certificate in Gas Supply	—	—	1	—	1
Total...	—	79	79	66	79
Grand total ...		158		145	

Examinations, 1942.

The more detailed observations of the Board of Examiners on the different Question Papers are set forth below. The comparative schedule of Examination Candidates shows that the total number of candidates entered for the 1942 Examinations is slightly lower than those in 1941, the decrease being in the number of Internal candidates.

The Board regrets to find that the standard of the candidates generally has not improved on that of 1941. The difficulties arising from the continuing state of war, particularly shortage of staff and other wartime activities which curtail the time available for study, and the discontinuation of a number of Approved Courses are fully appreciated by the Board. But the questions were carefully chosen so that candidates, daily engaged in their respective spheres on the manufacture and/or supply side of their Undertaking, should have had no undue difficulty in answering them. It must be assumed that candidates have either not made careful observation of the many points which occur in the daily routine, or if they have done so they have not kept a written record of these observations. Consequently in nearly all their reports the examiners have to record that candidates appeared to have little detailed knowledge of their subject and made generalized or long rambling statements.

Most candidates were unable to strike a mean between a detailed drawing and a rough diagram; in other words they seemed unable to picture in their minds and transfer to paper straightforward diagrams which would help them to answer questions.

Ordinary Grade Gas Engineering (*Manufacture*).

Number of candidates who sat for the Examination:

Class.	Internal—29. No.	Internal—29. %	External—28. No.	External—28. %	Total—57. No.	Total—57. %
1st	1	3.5	6	21.4	7	12.2
2nd	9	31	16	57.2	25	43.9
Fail	19	65.5	6	21.4	25	43.9

The average result in Ordinary Grade Gas Engineering (Manufacture) was poor. Composition and descriptive powers were lacking in a large number of candidates. Insufficient care was exercised in reading the questions, and many candidates wasted time by giving unnecessarily lengthy and rambling descriptions. Descriptions of the vertical coke extractor were very poor. The question on the plant used for the dehydration of coal gas was the least popular, although those candidates who did attempt it had a fair knowledge of the plant. On the other hand, the most popular question was that dealing with purifiers and was fairly well answered.

Higher Grade Gas Engineering (*Manufacture*).

Number of candidates who sat for the Examination:

Class.	Internal—12. No.	Internal—12. %	External—20. No.	External—20. %	Total—32. No.	Total—32. %
1st	1	8.3	1	5	2	6.2
2nd	5	41.7	9	45	14	43.8
Fail	6	50	10	50	16	50

The results of the Higher Grade Examination in Gas Engineering (Manufacture) were very disappointing, and the standard low.

This paper was set with a definite practical bias, but a portion of each question was intended to test the candidates' knowledge of the theory. On the whole, descriptions of plant were fairly good and sketches were mostly well done. Many candidates, however, showed a lamentable ignorance of even elementary principles of design, and the reasons for the adoption of particular plants and their methods of operation.

Diploma Grade Gas Engineering (*Manufacture*).

Number of candidates who sat for the Examination:

1st Class	0
2nd Class	2
Fail	2
Total	4

Generally speaking the results of the Diploma Examination were disappointing and, on the whole, the standard was not up to what one is entitled to expect from Diploma Grade candidates even in wartime. The students had apparently little detailed knowledge of their subject and only made generalized statements. A knowledge of current literature and problems was noticeable by its absence.

Ordinary Grade Gas Engineering (*Supply*).

Number of candidates who sat for the Examination:

Class.	Internal—14. No.	Internal—14. %	External—17. No.	External—17. %	Total—31. No.	Total—31. %
1st	3	21.4	3	17.6	6	19.4
2nd	6	42.9	11	64.8	17	54.8
Fail	5	35.7	3	17.6	8	25.8

The answers submitted were, on the whole, moderate. Few candidates had a good practical conception of main-laying. More practical experience is obviously required. The general standard of drawing was poor. Candidates do not seem to realize that a well-drawn sketch would save much descriptive writing and give more conclusive proof of knowledge than the lengthy rambling descriptions. Answers showed a general inability to apply Boyle's Law correctly.

Higher Grade Gas Engineering (*Supply*).

Number of candidates who sat for the Examination:

Class.	Internal—11. No.	Internal—11. %	External—7. No.	External—7. %	Total—18. No.	Total—18. %
1st, with distinction	0	—	1	14.3	1	5.5
1st	0	—	1	14.3	1	5.5
2nd	8	72.7	3	42.8	11	61.2
Fail	3	27.3	2	28.6	5	27.8

Of the 18 candidates who entered for the Higher Grade Examination in Gas Engineering (Supply) there was none of outstanding merit. The general standard of answers was lower than in previous years, and the handwriting, spelling and composition left much to be desired. Sketching was, in most cases, very poor. The answers submitted revealed the failure on the part of many candidates to display knowledge—fundamental, practical, and theoretical—of gas distribution and its ramifications. Questions on such universally employed machines as gas boosters were poorly answered. On the other hand, many candidates were really well versed in the various methods of utilizing gas, and it was refreshing to note the obvious knowledge of heat economy in industrial plant. Dalton's Law was fairly well known, but its practical application was rarely appreciated.

Questions involving arithmetical calculations were not well done.

Of the few candidates who attempted the question on illumination only one had any idea of how to answer it.

Certificate in Gas Supply.

One candidate entered for the Examination for the Certificate in Gas Supply and failed. The candidate did not seem to have read the questions with sufficient care and, therefore, in some answers failed completely to deal with the points required.

Diploma Grade Gas Engineering (Supply).

Two candidates entered for the Diploma Examination in Gas Engineering (Supply), of whom one secured a First Class Pass on the written paper and the other failed.

Minor Course Examinations in Gas Supply Practice and Gasfitting.

The detailed reports of the examiners of the City and Guilds of London Institute in Gas Supply Practice and Gasfitting are not yet available, but the following figures show the number of candidates who entered and passed:

Gas Supply Practice: 2 candidates entered—1 first class, 1 second class.

Gasfitting, Grade I: 187 candidates entered—137 passed, 50 failed.

Grade II: 113 candidates entered—9 first-class with distinction, 40 first class, 33 second class, 31 failed.

Final Grade: 71 candidates entered—8 first class with distinction, 32 first class, 26 second class, 5 failed.

THE INSTITUTE OF GAS TECHNOLOGY IN ACTION*

By HAROLD VAGTBORG,

Director, Institute of Gas Technology, Chicago, Illinois

ON Sept. 15, 1941, the new Institute of Gas Technology opened its doors for service to the Gas Industry. Thus was culminated two years of careful planning to establish an institution which would assist the Gas Industry not only to maintain but to improve its position for service to the public by taking advantage of intensive research and the training of men for the Industry.

The four major objectives of the new Institute, in addition to the training of men and research, include the collecting and disseminating of scientific information, and the encouraging of independent research within the Industry. During the months which have passed since the opening of the Gas Institute, substantial progress has been made on all fronts.

Generally speaking, the Institute of Gas Technology follows closely the pattern of the Institute of Paper Chemistry, which has made such an outstanding contribution to the paper and pulp industry in the training of technologists and the conducting of both fundamental and applied research.

Contrary to the belief of some individuals, the training of men and the conducting of research can go hand in hand in one institution. For optimum results it is best to divide the staff into two general groups, one group acting as the instructors to the student body for at least part of the time and utilizing the remainder of their time for certain types of research work, and the other group doing research exclusively on problems basic to the Industry and on company sponsored projects.

In order to make both these programmes successful, it is necessary to assemble suitable and substantial equipment and facilities which are then available to both programmes. The students, too, assist on research basic to the Industry in somewhat restricted fields in the form of thesis problems, but do not come in contact with the research sponsored by individual companies.

"Technology Centre" in Chicago is the location of the new Institute of Gas Technology which is affiliated with the Illinois Institute of Technology. In addition to these two Institutes on the one campus there is also the Armour Research Foundation, which is an industrial research organization. Each is a separate entity, operating independently but co-operating one with the other. Affiliation has helped the new Institute to get quickly under way and thereby be in a position to produce results in a short time. The Gas Institute is housed in a relatively new building, and its facilities include a classroom for the students, offices for the staff, a library, a laboratory for student activities, and a separate laboratory for research on projects basic to the Industry and on problems sponsored by individual companies. As time goes on the Institute will expand to the point where its own staff and facilities will be so extensive that it will be entirely self-contained, and will use only on occasion the consultation services of the other institutions.

The research programme of the Institute is organized to do three types of work: (1) Purely scientific research, (2) research on basic problems of the Industry, (3) sponsored research projects. Pure research and research on problems basic to the Industry are carried on from the general funds provided through contributions to the programme from member companies. Any patentable developments belong to the Institute, but are available to member companies on a licence basis. Research conducted for individual companies or groups of companies is done in a confidential manner, and the results or patents are available only to the sponsoring company or companies. Thus the Gas Institute is able to carry on research on the fundamental problems in the Industry for the membership at large, and at the same time conduct private investigations for individual companies.

For some weeks past the entire teaching staff of the Institute has been engaged in the elaboration and detailing of the curriculum. This has been an unusual problem for the reason that it was necessary to include the basic science essentials as normally required for a Doctor of Philosophy degree, and at the same time bring in a substantial number of courses which relate specifically to the Gas Industry. To do this properly it has been determined that it will take four years of academic work to complete the requirements for the degree, and the student, in addition, must work in the Industry for three summer periods of three months each. Dr. Thiesmeyer, Student Counsellor, reports that the response to the distribution of dossiers on the students available for summer employment is such he could place all the men several times, but before making a decision he wants to hear from the remaining companies.

The curriculum has been so organized that even if a student attends the Gas Institute for only one year he will still be of material help to the Industry. He will have learned science essentials and the background of the Gas Industry, and would make an excellent addition to the laboratory staff of some gas company. At the end of the second year a man who has fulfilled his educational requirements will be given the Master of Science degree, and if he should decide not to continue as a student of the Gas Institute he will be sufficiently well trained in the fundamentals of science and engineering and will, in addition, have covered a number of courses relating to Gas Industry problems. The man with this background can go into the Gas Industry in either a scientific or minor executive capacity. By the time the student has reached his third year he has covered science and engineering essentials and is ready to concentrate on gas technology. In this year he will learn, among other things, about "cracking"; hydrocarbons; unit processes; and new methods for the manufacture, distribution, and utilization of gas, both natural and manufactured. He will have studied synthetic solvents and the many by-products of the Industry and will have covered course work in public utilities and plant management. He will understand research techniques and research opportunities. If for any reason at the end of the third year he finds he is not research minded, he will make an excellent candidate for a position in the Industry in several capacities relating either to administration, engineering, or science.

It is expected that about 60% of the students will go on to the fourth year. These will be men who have demonstrated their research-mindedness and ability. They will spend the entire fourth year on a research project relating to a problem basic to the Industry, which problem must eventuate as a significant contribution to the knowledge of gas technology.

Detailed preparations are being made for the incoming class of thirteen carefully selected students who will make up the second class at the Gas Institute. There is much more that can be said about the training programme, but other things are going on during the typical day.

In the research laboratory there are new developments in connexion with work which relates to research on problems basic to the Industry.

* Address delivered before A.G.A. 37th Annual Natural Gas Convention, May 4–6, 1942.

The Adsorption Group, consisting of R. C. Kintner and R. L. Hicks, has succeeded in completing adsorption equipment which has some very unique features. For come time this group has been organizing broad research problems in connexion with physical separation of the components of gas.

The Catalysis Group has been moving along with several projects, which include synthetic rubber and utilization of by-products from manufactured gas. One batch of synthetic rubber has just been extracted and will shortly go over for compounding in the rubber mill. We have all recognized that there is a standard method for producing synthetic rubber from gas, but we realize, too, that the most economical means for doing this has not yet been found.

The Engineering Group has completed the drawings covering the design of apparatus to be used in the control of gas hydrates and has turned drawings over to the machine shop where the unit is to be fabricated. During the time it will take to complete the unit for experimental work the group will cover preliminary work on the study of natural gas line purging.

The first sponsored research project established at the Gas Institute was for the Rochester Gas and Electric Corporation and relates to the problem of removal of organic sulphur. During the past few weeks Dr. Hicks has been compiling abstracts of his literature search, so that when actual laboratory operations begin these can start where others have left off, and the entire project can be based upon a foundation of the best existing knowledge of the problem. He has now recommended a meeting of the staff and representatives of the sponsor who act as a steering committee, so that the initial laboratory programme can be established.

We have just learned from Major Forward, of the American Gas Association, that the decision was reached to place an Association project with the Gas Institute. This project is entitled, "Improved Techniques for Isolating and Identifying Organic Sulphur," and is under the jurisdiction of the Organic Sulphur Sub-Committee of the Technical Section Committee on Gas Conditioning. Anticipating this project the Gas Institute has solicited applications from several gas analysts, and will base selection of the analyst upon qualifications of ability to develop meticulous analysis techniques. It may be that during certain periods of the year this man will give a course in gas analysis to the students of the Institute. It is obvious that the staff of the Gas Institute can develop specialization having a permanent tenure, and as time goes on they will be in a position to render optimum service.

Other sponsored research projects are now in various stages of negotiation.

The Gas Institute library is growing daily. The library's services comprise aid to the Gas Institute staff and students in literature and patent searching; current reviewing of literature on gas technology for the benefit of member companies; and miscellaneous bibliographical, translating, and abstracting services designed to make all publications on gas technology a living force in support of development and research. In addition to these services the library will collect regularly all available existing scientific information relating to the Gas Industry, will correlate this material, and issue bulletins to its members. Thus the members will be informed of recent developments, and will be stimulated to conduct research in their own laboratories. It will save countless hours of duplication in reading over current scientific literature.

An institution is not built overnight, but it is obvious that the greater the initial support the quicker results can be expected. The entire financial structure of the Gas Institute is built upon the principle that small yearly contributions from a large number of supporting companies will accumulate to a truly significant industry training and research fund.

The Institute of Gas Technology was created by and for the Gas Industry, and with its complete support can be a significant means of insuring the future of the Industry.

INSTITUTION OF GAS ENGINEERS EXAMINATION RESULTS

The undermentioned candidates were successful in the 1942 Examinations in Gas Engineering (Manufacture), Gas Engineering (Supply), and Gas Supply of The Institution of Gas Engineers.

EXTERNAL CANDIDATES (43)

Diploma in Gas Engineering (*Manufacture*) (1)

Class.	Name.	Town.	Subject of Thesis.
Second ...	Jones, K. E. ...	Kidderminster ...	"The Effect on Storage Capacity and on Works Conditions due to the Shutting Down of a Waterless Holder at the Outbreak of War."

Higher Grade Certificate in Gas Engineering (*Manufacture*) (12)

Class.	Name.	Town.
First ...	Britton, J. C. ...	Sheffield
,, ...	Gregory, J. R. ...	Oswaldtwistle
Second ...	Blinkhorn, A. ...	Bolton
,, ...	Harland, W. S....	Rochdale
,, ...	Judd, S. ...	Hitchin
,, ...	Lomax, J. ...	Colne
,, ...	Parker, J. ...	Buxton
,, ...	Patterson, S. K.	Dunfermline
,, ...	Richards, B. D.	Haywards Heath
,, ...	Sapsford, J. ...	Rochdale
,, ...	Sweeting, K. J.	Taunton
,, ...	Wilson, F. ...	Middlesbrough

Ordinary Grade Certificate in Gas Engineering (*Manufacture*) (11)

Class.	Name.	Town.
First ...	Barlow, J. C. R. ...	Stoke-on-Trent
,, ...	Randall, R. C....	Warwick
Second ...	Allen, L. K. ...	Earley
,, ...	Birch, L. S. ...	Jamaica
,, ...	Forbes, P. C. ...	Hoddesdon
,, ...	Luxon, G. M. ...	Exeter
,, ...	Metcalfe, F. T....	Rochdale
,, ...	Santo, B. ...	Lostwithiel
,, ...	Spiller, W. J. ...	Paignton
,, ...	Tomlinson, W. ...	Winsford
,, ...	Winslow, D. G.	Kenton

Higher Grade Certificate in Gas Engineering (*Supply*) (9)

Class.	Name.	Town.
First ...	Kenworthy, H. W. ...	Sheffield
Second ...	Fairman, J. R. ...	Southampton
,, ...	Halliwell, F. B. ...	Loughborough
,, ...	Kinsey, R. ...	Bradford
,, ...	Nicholson, T. A.	Weston-super-Mare
,, ...	Ricketts, T. S. ...	Hertford
,, ...	Stewart, W. C.	Cannock
,, ...	Talbot, T. H. ...	West Bromwich
,, ...	Winslow, D. G.	Kenton

Ordinary Grade Certificate in Gas Engineering (*Supply*) (9)

Class.	Name.	Town.
Second ...	Arnold, R. C. ...	Loughborough
,, ...	Carpenter, T. ...	Hereford
,, ...	Douthwaite, J. ...	Scarborough
,, ...	Friggens, J. B. ...	Penzance
,, ...	Greenley, W. ...	Ampthill
,, ...	Hubbard, E. H.	Salisbury
,, ...	O'Connor, A. T.	Rushden
,, ...	Sharp, A. N. ...	Clitheroe
,, ...	Wellock, M. ...	Halifax

Ordinary Grade (*Single Subject*) *Examination in Gas Engineering* (*Supply*) *to qualify to sit for the Diploma Examination in Gas Engineering* (*Manufacture*) (1)

Class.	Name.	Town.
First ...	Keywood, H. C. ...	Blackburn

INTERNAL CANDIDATES (39)

Higher Grade Certificate in Gas Engineering (*Manufacture*) (5)

Class.	Name.	Centre.
First ...	Barker, F. C. ...	Bradford
,, ...	Marshall, D. ...	Kirkcaldy
Second ...	Jones, C. B. ...	Cardiff
,, ...	Lockett, R. ...	Manchester
,, ...	Thomson, R. J. ...	Glasgow

Ordinary Grade Certificate in Gas Engineering (*Manufacture*) (9)

Class.	Name.	Centre.
First ...	Tait, S. A. ...	Newcastle-upon-Tyne
Second ...	Charlton, D. ...	,,
,, ...	Christie, J. T. ...	Glasgow ,,
,, ...	Faulkner, E. L....	Manchester
,, ...	Hodgson, R. ...	Bradford
,, ...	Hubbard, B. L.	Derby
,, ...	Hutchins, A. V. S.	Cardiff
,, ...	Kinsey, W. O. ...	Manchester
,, ...	Robson, E. L. ...	Newcastle-upon-Tyne

Higher Grade Certificate in Gas Engineering (*Supply*) (16)

Class.	Name.	Centre.
First ...	Castell, A. H. ...	Westminster
,, ...	Rolls, C. G. S. ...	Birmingham
,, ...	Thompson, A. J.	East Ham
,, ...	Westbrook, G. A.	,,
Second ...	Aveyard, C. ...	Bradford
,, ...	Bruce, R. D. ...	Westminster
,, ...	Butler, C. W. ...	Birmingham
,, ...	Cole, A. ...	Bradford
,, ...	Edmonds, W. H.	East Ham
,, ...	Goldsmith, F. G.	,,
,, ...	Heasman, H. V.	Westminster
,, ...	Langford, R. G.	,,
,, ...	Mann, W. J. ...	East Ham
,, ...	Markham, E. ...	,,
,, ...	Phillips, A. L. ...	Westminster
,, ...	Williams, P. F.	,,

Ordinary Grade Certificate in Gas Engineering (*Supply*) (7)

Class.	Name.	Centre.
First ...	Fitzsimons, W. A.	Bradford
Second ...	Aitken, E. J. ...	Dundee
,, ...	Campbell, A. ...	Glasgow
,, ...	Cornock, J. S. ...	,,
,, ...	Marshall, J. H.	Dundee
,, ...	Morton, W. ...	Edinburgh
,, ...	Walker, J. M. ...	Dundee

Ordinary Grade (*Single Subject*) *Examination in Gas Engineering* (*Supply*) *to qualify to sit for the Diploma Examination in Gas Engineering* (*Manufacture*) (2).

Class.	Name.	Centre.
First ...	Harland, W. S.	Manchester
,, ...	Sapsford, J. ...	,,

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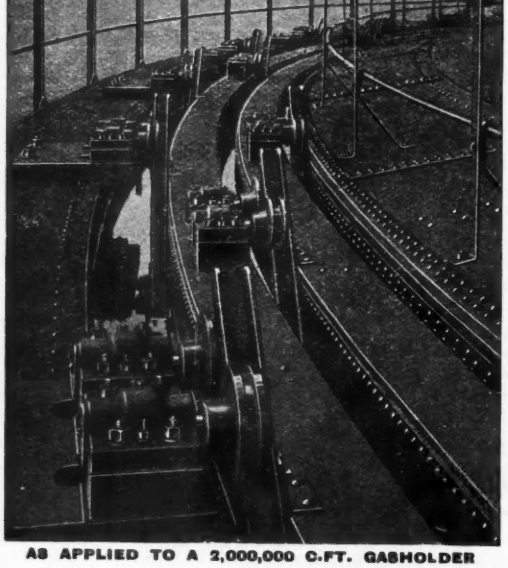

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Gas Products Prices

The London Market Aug. 10.

The only change in the prices of Coal Tar Products in the London Market refers to 95/160 Solvent Naphtha, which is now about 2s. 3d. to 2s. 7d. per gallon.

The Provinces Aug. 10.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 1s. 10d., pure, 2s. 5d. (controlled by the Control of Toluene No. 2 Order, July 3, 1941, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 1s. to 1s. 4d. according to quality. Solvent naphtha, naked, North, 2s. 2d. to 2s. 6d. Heavy naphtha, North, 1s. 10d. to 1s. 11d. Carbolic acid, 60's, controlled by the Coal Tar Acids Prices (Inland) Order, 1942, operative from May 1. Naphthalene, controlled by the Naphthalene prices (Inland) Order, 1942, dated April 15, 1942, and operative from May 1, 1942, £19 to £19 10s.—bags free. Anthracene, controlled by the Anthracene Prices (Inland) Order, 1942, operative from May 1. Filtered heavy oil (min. gr. 1,080), 7½d. to 8d. Creosote oil has been generally controlled as to direction and price for some time past. Current value—fuel grades 5d. to 5¼d; timber preservation and other purposes 4¾d. to 6d. These prices apply as from May 13.

*In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Tar Products in Scotland Aug. 8.

Production is well looked after. Refined tar controlled. Value about 4½d. per gallon *ex* Works naked. Creosote oil: Specification oil, 6¾d. to 7d.; low gravity, 7¼d. to 7½d.; neutral oil, 6⅝d. to 7d. per gallon; all *ex* Works in bulk. Cresylic acid continues in good demand at 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha 6½d. to 7d. Solvent naphtha: 90/160 grade, 2s. to 2s. 3d., and 90/190 Heavy Naphtha 1s. 9d. to 2s. per gallon. Pyridine: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

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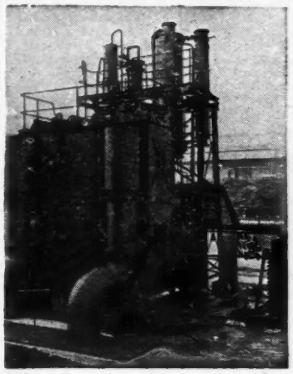

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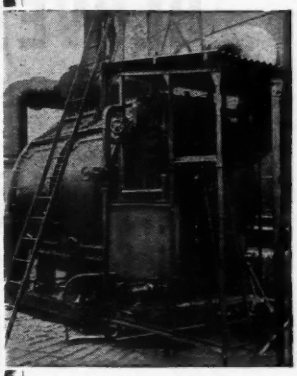

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★On August 4 our London Office returned to our old address, to which all communications should now be sent.

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GAS STOCKS AND SHARES

Gas stocks and shares were fairly well supported and values continue to be strongly held. There were few price changes during the week, but included among these was a sharp rise of 15 points in Hampton Court Ordinary Stock to 97½—transactions being recorded up to 98 against the previous best of 90 in June. This Company distributed 7¼% on its ordinary stock for a number of years prior to the war although the rate has dropped to 5% since 1940.

Comparing the prices in the lists below with those published on July 1 it will be seen that over 25% of the stocks quoted have appreciated in value, some of the increases being quite considerable, especially in the Supplementary List.

The following price changes occurred during the week:

OFFICIAL LIST

Alliance & Dublin Ord.	98—103	+3
Cape Town 4½ p.c. Cum. Pref. ...	1½—2½	+½
South Suburban Ord. (x.d.)... ...	78—83	Aug. 4
Ditto 5 p.c. Pref. (x.d.) ...	95—100	"
Ditto 4 p.c. Pref. (x.d.)	76—81	"
Ditto 3½ p c. Red. Pref. (x.d.)	87—92	"
Wandsworth 5 p.c. Deb.	108—113	+1

SUPPLEMENTARY LIST

Cambridge 7 p.c. Cons. "B" (x.d.)	125—135	Aug. 4
Hampton Court Ord....	95—100	+15
Reading 4 p.c. Deb.	92—97	+2

PROVINCIAL EXCHANGES

Newcastle Units	20/3—20/9	—/3d.
Sheffield Cons.	126—128	+1½

APPOINTMENTS VACANT

(*See also p. 258*)

ROYAL BURGH OF DUMFRIES

(GAS DEPARTMENT)

APPLICATIONS are invited for the appointment of TECHNICAL ASSISTANT, from persons having a general training in modern Gas Manufacture and Distribution, including Laboratory and Drawing Office work.

Salary offered £250 plus cost of living bonus which is at present £30.

The position regarding National and Military Service should be indicated.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful Candidate will be required to pass a Medical Examination.

Applications with *copies* of two recent Testimonials should be lodged with the undersigned, endorsed "Technical Assistant," not later than Friday, Aug. 28, 1942.

J. HUTCHEON,
Town Clerk.
Dumfries.

Quotations on the London and Provincial Stock Exchanges

OFFICIAL LIST

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Aug. 6.
1,767,439	Mar. 9	5	5	Alliance & Dublin Ord. ...	98—103
374,000	June 29	4	4	Do. 4 p.c. Deb.	94—99
972,345	May 11	5	5	Asscd. Gas & Water U'd'ts Ord.	16/3—17/3
500,000	"	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	15/—17/—
535,545	"	4	4	Do. 4 p.c. Red. Cum Pref.	15/6—17/6
341,966	"	4	4	Do. 4 p.c. Irred. Cum. Pref.	12/—14/—
561,370	Mar. 9	7	7	Barnet Ord. 7 p.c.	125—130
300,000	May 18	1/4⅜	1/9⅜	Bombay, Ltd.	18/6—20/6
690,407	Feb. 23	7	7	Bournemouth 7 p.c.max. ...	125—130
362,025	June 15	4	4	Do. 4 p.c. Deb. ...	95—100
659,955	Mar. 2	2½	3½	Brighton, &c., 5 p.c. Con. ...	72—77
855,000	" 16	6	6	Brit. Gas Light Ord.	72—77
545,000	June 29	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	105—115
120,000	June 15	4	4	Do. 4 p.c. Red. Deb.	77—82
10,000	Nov. 6 '33	6	4	Cape Town, Ltd., 4½ p.c. Cu. Pf.	1½—2½
626,860	July 13	6	6	Cardiff Con. Ord.	100—105
24,500	June 8	7	7	Colombo 7 p.c. Red. Pref. ...	19/—21/—
764,169	Mar. 23	-/11.48	-/9.56	Colonial Gas Assn. Ltd. Ord. ..	⅛—⅜
400,000	"	1/3.30	1/3.298	Do 8 p.c. Pref. ...	⅝—¾
1,748,935	July 22 '40	2	3	Commercial Ord.	34—39
620,000	June 8	3	3	Do. 3 p.c. Deb.	58—63
286,344	Feb. 16	5	5	Do. 5 p.c. Deb.	95—100
807,560	Feb. 23	6	6	Croydon sliding scale	97—102
644,590	"	5	5	Do. max. div.	83—88
620,385	June 29	5	5	Do. 5 p.c. Perp. Deb. ...	108—113
179,500	Feb. 9	5	5	East Surrey 'B,' 5 p.c.	80—85
176,461	June 29	5	5	Do. 5 p.c. Deb. (Irred.)...	107—112
250,000	July 13	4	6	Gas Consolidation Ord. 'B' ...	15/—17/—
250,000	May 11	4	4	Do. 4 p.c. Red. Cum. Pref.	14/6—16/6
19,122,910	July 29 '40	3⅜	4½	Gas Light & Coke Ord. ...	13/—14/—a
2,600,000	"	3½	3½	Do. 3½ p.c. max.	50—55
4,477,106	"	4	4	Do. 4 p.c. Con. Pref. ...	66—71
2,993,000	July 8 '40	3⅜	3⅜	Do. 3⅜ p.c. Red. Pref. ...	72—77
8,602,497	June 1	3	3	Do. 3 p.c. Con. Deb. ...	80—85
3,642,770	"	5	5	Do. 5 p.c. Red. Deb. ...	104—108
3,500,000	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	103—107
700,000	Mar. 9	3½	3½	Do. 3½ Red. Deb.	89—94
6,600,000	May 13 '40	4	8	Imperial Continental Cap. ...	63—68
43,820	July 27	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95
231,978	Feb. 23	5	5	M.S. Utility 'C' Cons.	75—80
918,657	"	4	4	4 p.c. Cons. Pref.	78—83
675,000	May 4	†4	†4	Montevideo, Ltd.	82—87
300,000	April 27	9	7	Oriental, Ltd.	85—95
368,537	June 15	3½	2½†	Plymouth & Stonehouse 5 p.c.	65—70
621,667	Feb. 9	7½	7½	Portsmouth & Gosport Cons.	92—97
648,999	May 26	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	17/6—19/6
597,972	Mar. 9	4½	4½	Do. 4½ p.c. Cum. Pref. ...	16/6—18/6
2,528,714	June 8	1/—	7½	South East'n Gas Cn. Ld. Ord.	14/6—16/6
1,000,000	Mar. 2	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	16/—18/—
1,068,869	"	4	4	Do 4 p.c. Irred. Cum. Pref.	12/6—14/6
6,709,895	Aug. 5 '40	4	4	South Met. Ord.	57—62
1,135,812	"	6	6	Do. 6 p.c. Irred. Pref. ...	80—85
850,000	"	4	4	Do. 4 p.c. Irred. Pref. ...	62—67
1,895,445	June 29	3	3	Do. 3 p.c. Perp. Deb. ...	76—81
1,000,000	July 13	5	5	Do. 5 p.c. Red. Deb. ...	100—105
1,543,795	Aug. 4	4	4	South Suburban Ord. 5 p.c ...	78—83*
512,825	"	5	5	Do. 5 p.c. Perp. Pref. ...	95—100*
500,000	"	4	4	Do. 4 p.c. Perp. Pref. ...	76—81*
250,000	"	3½	3½	Do. 3½ p.c. Red. Pref. ...	87—92*
888,587	June 15	3	5	Do. 5 p.c. Perp. Deb. ...	108—113
750,541	Feb. 9	2	6	Southampton Ord.	72—77
350,000	"	5½	5½	Swansea 5½ p.c. Red. Pref. ...	95—100
1,076,495	"	5	5	Tottenham & District Ord. ...	86—91
338,555	"	5	5	Do. 5 p.c. Pref.	95—100
453,380	June 8	4	4	Do. 4 p.c. Perp. Deb. ...	87—92
1,247,505	" 29	4	†4	U. Kingdom Gas Cor. Ord. ...	15/6—17/6
1,085,952	May 18	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	16/6—18/6
772,709	"	4	4	Do. 4 p.c. 1st Red. Cum.Pref.	15/6—17/6
745,263	June 22	4½	4½	Do. 4½ p.c. 2nd Non.Cum. Pf.	14/—16/—*
1,200,000	Mar. 16	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94
380,606	April 27	6⅝	6⅝	Uxbridge, &c., 5 p.c.	102—107
1,371,138	Feb. 2	4	4	Wandsworth Consolidated ...	80—85
1,825,768	"	4	4	Do. 4 p.c. Pref.	77—82
1,343,964	June 15	5	5	Do. 5 p.c. Deb.	108—113
383,745	"	4	4	Do. 4 p.c. Deb.	89—94
558,342	Mar. 2	5	5	Watford & St. Albans Ord. ...	98—103
300,000	June 8	3½	3½	Do. 3½ p.c. Red. Deb. ...	84—89

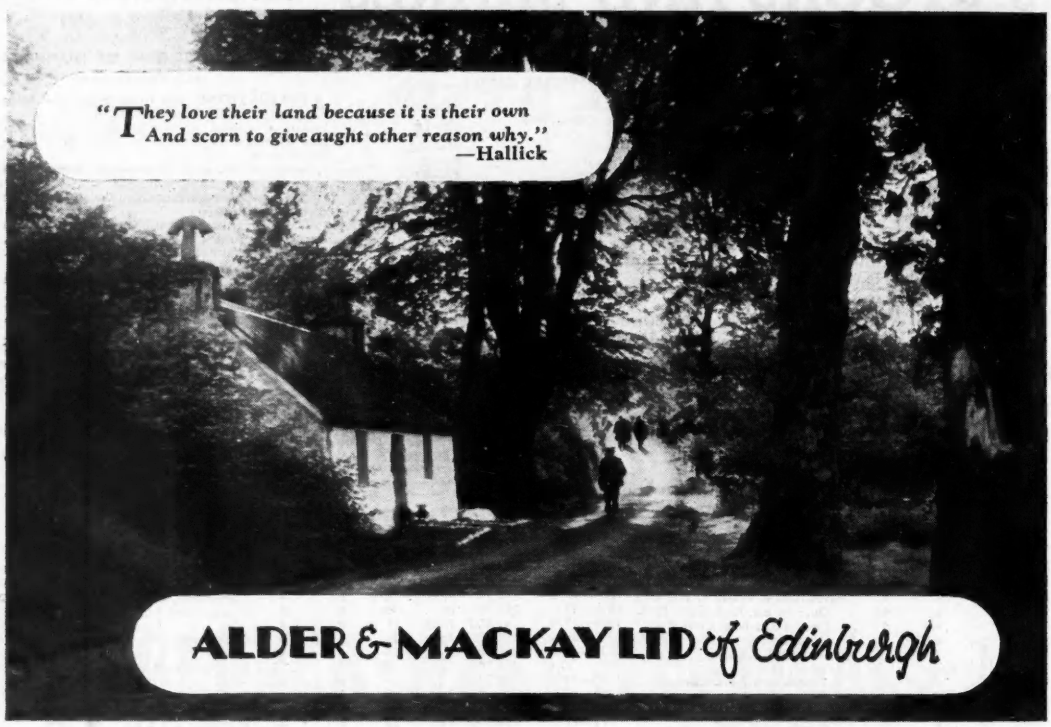
SUPPLEMENTARY LIST

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Aug. 6.
351,685	Juue 15	5	5	Brighton, &c., 5 p.c. Perp. Deb.	105—110
415,250		4	4	Bristol Gas Co., 4 p.c. New Deb.	98—103
140,205	Aug. " 4	7	7	Cambridge, &c., 7 p.c. Cons. 'B'	125—135*
295,932	Mar. 9	5	5	Cheltenham, 5 p.c. Cons. Ord....	95—100
42,500	June 15	4	4	Do. 4 p.c. Perp. Deb....	90—95
150,000	Feb. 23	4	4	Croydon Gas, 4 p.c. Pref. (Irr.)	78—83
130,000	June 29	4	4	Do. 4 p.c. Deb.	95—100
146,700	Feb. 9	5½	5½	East Surrey, 5½ p.c. Pref. 'A' ...	95—100
53,220	" 9	6	6	Do. 6 p.c. Cum. Pref. ...	115—120
...	Aug. 19 '40	6	4	Eastbourne, 'B' 3½ p.c.	37—42
239,135	July 13	5	5	Gas Consolidation 'A' Ord. (£1)	11/6—13/6
156,600	Feb. 23	5	5	Hampton Ct's, 5 p.c. Cons. Ord.	95—100
18,000	Dec. 29	3½	3½	Malta & Med'n., 7 p.c. 1st Pref.	45—55
10,845	June 30'41	3½	3½	Do. 7½ p.c. 2nd Pref.	35—45
50,000	Feb. 23	£5 4 6	£5 4 6	Mid. South. Util., 'A' Cons. 5 p.c.	70—80
65,000	April 27	5	5	North Middlesex, 5 p.c. Pref. ...	90—95
70,000	Mar. 9	5	5	Plymouth & Stone., 5 p.c. Deb.	103—108
76,501	June 29	4	4	Reading, 4 p.c. Perp. Deb. ...	90—95
74,777	Mar. 31	4	4	Romford, 4 p.c. Debs. (Reg.) ...	92—97
21,000	June 15	5	5	Slough, 5 p.c. Perp. Deb.	100—105
211,740	"	5	5	Southampton, 5 p.c. Red. Deb.	95—100
363,575	July 1	5	5	Tottenham, 5 p.c. Reg. Red. Mt.	92—102
202,019	April 7	—	7⅜	Tunbridge Wells, 4 p.c. Scale ...	119—124
135,257	June 15	5	5	Uxbridge &c., 5 p.c. Perp. Deb.	105—110

PROVINCIAL EXCHANGES

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 31.
804,948	Mar. 2	5	5	Bath Cons.	98—101
122,577	Feb. 23	6	6	Blyth 5 p.c Ord.	100—105
1,667,250	July 13	5	5	Bristol, 5 p.c. max.	108—110
120,420	June 15	4	4	Do. 1st 4 p.c. Deb.	101—103
415,250	"	4	4	Do. 2nd 4 p.c. Deb. ...	99—101
328,790	"	5	5	Do. 5 p.c. Deb.	113—118
157,150	Feb. 2	5	6½	Chester 5 p.c. Ord.	97—100
92,500	June 15	4	4	Do. 4 p.c. Pref.	79—81
36,430	"	3½	3½	Do. 3½ p.c. Deb.	78—82
41,890	"	4	4	Do. 4 p.c. Red. Deb. ...	98—100
542,270	Feb. 9	6	9	Derby Cons.	115—120
55,000	June 15	4	4	Do. 4 p.c. Deb.	95—100
10,000	Mar. 23	10	10	Great Grimsby 'A' Ord. ...	155—165
6,500	"	10	10	Do. 'B' Ord. ...	155—165
79,000	"	10	10	Do. 'C' Ord. ...	145—155
732,000	Feb. 23	4	4	Hartlepool G. & W. Cn. & New	71—73
2,167,410	Mar. 2	6	6	Liverpool 5 p.c. Ord.	109—111
245,500	June 15	5	5	Do. 5 p.c. Red. Pref. ...	100—102
306,083	July 15	4	4	Do. 4 p.c. Deb.	98—100
20,000	June 23	5	5	Long Eaton 5 p.c. Pref.	9—11
80,000	"	5	5	Do. 5 p.c. Deb.	87—92
2,430,267	Feb. 9	5	5½	Newcastle and Gateshead Con.	20/3—20/9a
682,856	"	4	4	Do. 4 p.c. Pref.	93½—94½
776,706	Dec. 29	3½	3½	Do. 3½ p.c. Deb.	86½—87½
277,285	Nov. 3	5	5	Do. 5 p.c. Deb. '43 ...	99—101
274,000	March 17	5	5	Newport (Mon.) Ord.	86—89
13,200	Sept. 16	8⅝	7	Pontyp'l Gas & W. 10 p.c. 'A'	11½—12½
13,600	"	6	5	Do. 7 p.c. 'B'	9½—10½
40,000	"	5	6	Do. 7 p.c. 'C'	9½—10½
106,280	Feb. 9	10	10	Preston 'A' 10 p.c.	152—162
188,219	"	7	7	Do. 'B' 7 p.c.	111—121
1,806,339	Feb. 23	6½	6½	Sheffield Cons.	126—128
95,000	July 6	4	4	Do. 4 p.c. Deb.	98—101
332,351	Feb. 16	6	6	Sunderland 6 p.c. max. ...	111½—112½
192,150	Feb. 9	5	5	Weston-super-Mare Cons. ...	94—98
64,338	Jan. 5	4	4	Do. 4 p.c. Deb.	85—90
33,340	"	7½	7½	Do. 7½ p.c. Deb.	140—145

a—The quotation is per £1 of Stock. * Ex. div. † Paid free of income-tax. †For year.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And scorn to give aught other reason why."
—Hallick
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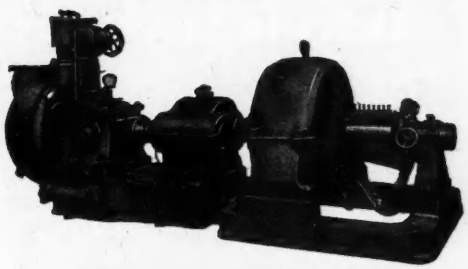
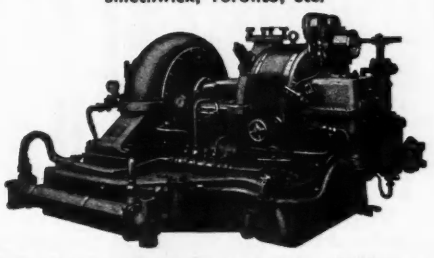
BROTHERHOOD
STEAM TURBINES FOR GASWORKS

Our Turbines, made for all powers up to 15,000 B.H.P. and for all conditions of service, are installed for driving Exhausters, Boosters, and Generators in many Gas Works, including:—

The Gas Light & Coke Co., South Suburban Gas Co., Wandsworth & District Gas Co., and in Works of Corporations and Companies at—Birmingham, Bristol, Coventry, Cardiff, Exeter, Liverpool, Manchester, Newcastle-on-Tyne, Preston, Portsmouth, Sheffield, Smethwick, Toronto, etc.



300 kW Back Pressure Geared Turbo-Generator.



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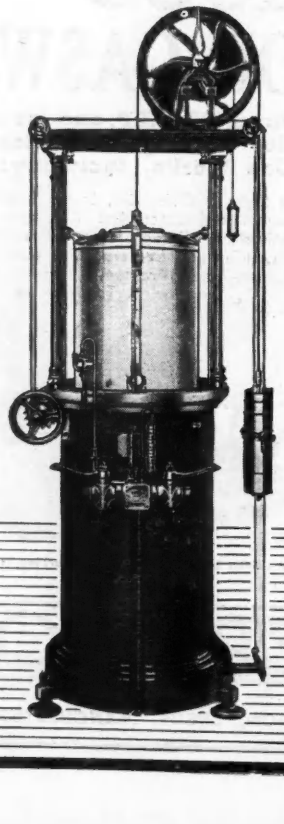

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